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Maine Agricultural Experiment Station

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FEEDING STUFF INSPECTION.

13.

This Bulletin contains the analyses of samples of Feeding Stuffs received from correspondents and collected by the inspectors in the fall and winter, 1905-6, and a discussion of the results of the inspection.

Requests for bulletins should be addressed to the
AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.

MAINE

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FEEDING STUFF INSPECTION.

CHAS. D. WOODS, Director.

J. M. BARTLETT, Chemist in charge of inspection analyses.

CHIEF REQUIREMENTS OF THE LAW.

The points of the law of most interest both to the dealer and consumer concisely stated, follow.

Kinds of Feed Exempt Under the Law. The law applies to all feeding stuffs *except* the following: hays and straws; whole seeds, meals, brans and middlings of wheat, rye, barley, oats, Indian corn, buckwheat and broom corn, sold separately; wheat bran and middlings mixed together and pure grains ground together.

Kinds of Feed Coming within the Law. The principal feeds coming under the provisions of the law are linseed meals, cottonseed meals, cottonseed feeds, pea meals, cocoanut meals, gluten meals, gluten feeds, maize feeds, starch feeds, sugar feeds, dried brewer's grains, dried distiller's grains, malt sprouts, hominy feeds, cerealine feeds, rice meals, oat feeds, corn and oat chops, corn and oat feeds, corn bran, ground beef or fish scraps, foods, poultry foods, stock foods, patented, proprietary and trade mark stock and poultry foods, mixed feeds other than those composed solely of wheat bran and middlings mixed together or pure grains ground together, and all other materials of similar nature.

The Brand. Each package of feeding stuffs coming within the law shall bear, conspicuously printed, the following statements:

The number of net pounds contained in the package.

The name or trade mark under which it is sold.

The name of the manufacturer or shipper.

The place of manufacture.

The place of business of manufacturer or shipper.

The percentage of crude protein.

The percentage of crude fat.

* *The Adulteration of Feeding Stuff.* If any foreign substances are added to whole or ground grain or wheat offals, the true mixture must be plainly marked upon the packages.

Duties of the Director. The Director shall in person or by deputy analyze at least one sample of each feeding stuff coming within the requirements of the law, and publish the results with such additional information as circumstances advise. He shall report all violations of the law to the Commissioner of Agriculture.

Penalties. The sale or offering for sale of feeding stuffs not properly branded, or containing a smaller percentage of protein and fat than are guaranteed, or of adulterated feeding stuffs, is punishable by a fine not exceeding \$100 for the first, and \$200 for each subsequent offense.

RESULTS OF THE INSPECTIONS FOR 1905-6.

The last bulletin on feeding stuff inspection was published in April, 1905. Prior to 1904 it had been the custom of the Station to collect a large number of samples of the feeding stuffs offered in the State for the purpose of analyses. With few exceptions the feeding stuffs are running fairly constant in composition, and for the past two years, greater attention has been paid to proper inspection than to the analyses. At least one sample has been drawn of each of the commercial feeding stuffs offered in the State, so far as they have been found by the inspector. In the parts of the State where the greater amount of feeding stuffs are used, four inspections have been made. There is an evident desire on the part of nearly all of the dealers, large and small, to conform to the requirements of the law, and with the single exception of mixed feeds (see discussion page 96), there is every reason to feel satisfied with the quality of the concentrated commercial feeding stuffs upon the market.

Unless with the possible exception of a single jobbing house, all of the large handlers of feeds appear to be trying to do a perfectly square, legitimate business. There has been a very marked improvement in the quality of goods, and particularly in their uniformity, since the enactment of the feeding stuffs law eight years ago. Not only have the feeders a better understanding of the feeds they use but the dealers have become aware of the quality of their goods, and why feeding stuffs differ from one another in feeding value.

The table on pages 83 to 88 gives the results of the analyses.

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found— per cent.	Guaranteed— per cent.	Found— per cent.	Guaranteed— per cent.	
Prime Cotton Seed Meal ...	42.38	41.00	8.80	9.00	2068
American Cotton Oil Co	41.50	41.00	-	9.00	2212
Cotton Seed Meal	41.88	38.61	8.68	-	2187
Butler Kyser Oil Co					
Imperial Brand Prime Cotton Seed Meal.....	41.63	40.00	7.64	8.50	2133
C. A. Tindall & Co., Memphis, Tenn	39.13	40.00	-	8.50	2164
	41.50	40.00	-	8.50	2189
Green Diamond Brand Cotton Seed Meal	42.44	43.00	8.56	9.00	2084
Chapin & Co	41.13	41.00	-	9.00	2172
Magnolia Brand Cotton Seed Meal.....	43.44	43.00	-	9.00	2035
Chas. M. Cox Co	40.63	43.00	8.38	9.00	2071
	41.50	43.00	-	9.00	2209
Phoenix Cotton Seed Meal.....	41.38	41.00	9.30	9.00	2085
D. L. Marshall	41.63	41.00	-	9.00	2169
	41.50	41.00	-	9.00	2126
Owl Brand Cotton Seed Meal.....	42.25	41.00	9.03	7.00	2089
F. W. Brod�	42.63	41.00	-	7.00	2109
	42.75	41.00	-	7.00	2167
Cotton Seed Meal	43.00	43.00	-	9.00	2067
H. E. Bridges & Co	40.06	43.00	-	9.00	2122
	40.94	43.00	10.50	9.00	2195
	40.56	43.00	-	9.00	2208
Dixie Brand Cotton Seed Meal.....	37.75	41.00	-	9.00	2131
Humphreys, Goodwin & Co.....	41.19	41.00	10.83	9.00	2140
	41.00	41.00	-	9.00	2210
Prime Cotton Seed Meal.....	40.44	41.00	-	9.00	2066
Hunter Bros. Milling Co.....	41.25	41.00	8.78	9.00	2073
	39.25	41.00	-	9.00	2115
	37.69	41.00	-	9.00	2116
	41.25	41.00	-	9.00	2121
	38.38	41.00	-	9.00	2125
	40.63	38.00	-	-	2156
Cotton Seed Meal	44.88	41.00	10.18	9.00	2107
J. E. Soper & Co.....	41.88	41.00	-	9.00	2155
Indian Brand Cotton Seed Meal	42.75	40.00	-	8.50	2002
National Cotton Seed Products Co.....	38.81	41.00	-	-	2045
	43.00	41.00	7.78	-	2136
	41.50	41.00	-	-	2214
Star Brand Cotton Seed Meal	39.13	42.00	-	9.00	2003
Sledge & Wells					
Star Brand Cotton Seed Meal	40.25	41.00	9.40	9.00	2086
J. T. & K. S. Wells.....	41.38	41.00	-	9.00	2161
Cotton Seed Meal	41.69	38.61	-	-	2132
Southern Cotton Oil Co.....	41.50	38.61	10.13	-	2176
Old Gold Cotton Seed Meal.....	41.63	41.00	8.13	9.00	2079
T. H. Bunch.....	42.50	41.00	-	9.00	2181

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found— per cent.	Guaranteed— per cent.	Found— per cent.	Guaranteed— per cent.	
Eagle Brand Cotton Seed Meal	41.63	43.00	10.60	9.00	2014
W. A. Kaiser & Co.....	40.06	43.00	-	9.00	2044
Battle Brand Prime Cotton Seed Meal	43.00	43.00	7.60	9.00	2134
W. P. Battle & Co., Memphis, Tenn	40.56	43.00	-	9.00	2213
Cotton Seed Meal.....	37.13	-	-	-	2005
From correspondents, brands not given....	44.94	-	-	-	2110
	42.25	-	-	-	2111
	42.75	-	-	-	2011
	*42.75	-	-	-	2015
	*40.69	-	-	-	2016
	*42.25	-	-	-	2017
	*43.75	-	-	-	2018
	*39.75	-	-	-	2030
	*37.88	-	-	-	2031
Cotton Seed Meal.....	*39.50	-	-	-	2032
Samples sent by jobbers to learn quality ...	*33.38	-	-	-	2033
	*40.69	-	-	-	2034
	*24.50	-	-	-	2048
	*25.19	-	-	-	2049
	42.25	-	-	-	2111
	42.13	-	-	-	2119
	41.25	-	-	-	2120
Glenwood Cotton Seed Feed.....	19.81	22.00	5.08	5.00	2174
D. L. Marshall Co	23.13	22.00	-	5.00	2183
Linseed Oil Meal	38.13	37.00	-	1.00	2007
American Linseed Co.....	37.00	37.00	3.88	1.00	2093
	36.38	36.00	2.30	1.00	2182
Viscid Oil Meal.....	28.81	31.00	11.63	7.50	2196
Milwaukee Elevator Co					
Chicago Gluten Meal.....	33.56	-	-	-	2050
Glucose Sugar Refining Co.....	32.88	38.90	2.45	3.00	2088
	34.19	38.00	-	3.00	2168
Jenks' Gluten Meal	31.06	36.00	7.70	5.00	2095
Huron Milling Co					
Gluten Feed	22.69	26.50	3.30	3.30	2173
Douglas & Co					
Buffalo Gluten Feed	23.69	25.00	2.70	3.00	2080
Glucose Sugar Refining Co	25.00	25.00	-	3.00	2162
	28.56	27.00	-	7.50	2012
	27.25	27.00	-	7.50	2025
Jenks' Gluten Feed	29.38	27.00	-	7.50	2036
Huron Milling Co	28.25	27.00	8.98	7.50	2070
	33.38	27.00	-	7.50	2127
	31.88	27.00	-	7.50	2175
Bay State Gluten Feed	21.06	26.00	4.73	3.00	2194
J. E. Soper & Co.....					
Tiger Gluten Feed	25.00	25.00	4.00	2.75	2082
St. Louis Syrup and Preserving Co	25.63	25.00	-	2.75	2188

*So far as known these goods were not sold in Maine.

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found— per cent.	Guaranteed per cent.	Found— per cent.	Guaranteed per cent.	
Warner's Gluten Feed	22.13	25.00	5.93	3.00	2077
Warner Sugar Refining Co	23.19	25.00	—	3.00	2198
Gluten Feed	*27.56	—	—	—	2128
Brand not known. Jobbers sample					
Anchor Distillers' Grains.....	16.00	†	5.88	†	2094
C. A. Krouse Grain Co., Milwaukee, Mich ...	15.56	†	—	†	2211
Continental Gluten Feed.....	31.63	35.00	—	12.50	2062
Continental Cereal Co	29.69	35.00	14.88	12.50	2180
	31.44	35.00	—	12.50	2200
Ajax Flakes	34.00	34.00	13.40	12.00	2097
Flint Milling Co.....	28.88	34.00	—	12.00	2184
Biles Fourx.....	34.25	33.00	11.65	11.00	2076
J. W. Biles Co	32.19	33.00	—	11.00	2177
Biles Ready Ration, Union Grains	24.63	24.00	7.23	7.00	2091
J. W. Biles Co.....	22.81	24.00	—	7.00	2163
Molasses Dairy Feed	14.19	16.00	3.24	3.00	2123
American Cereal Co					
Molasses Horse Feed	11.00	11.00	2.84	3.00	2124
American Cereal Co.....					
Schumachers' Stock Feed	10.75	12.00	5.18	5.00	2078
American Cereal Co	11.75	12.00	—	4.00	2178
Quaker Dairy Feed	15.75	14.00	4.63	3.50	2146
American Cereal Co					
Victor Corn & Oat Feed.....	8.50	9.00	4.35	4.00	2106
American Cereal Co	9.63	9.00	—	4.00	2165
Sucrene Dairy Feed.....	15.13	16.50	—	3.50	2059
	17.50	16.50	—	3.50	2060
American Milling Co	12.13	16.50	2.58	3.50	2158
	14.81	16.50	—	3.50	2216
Sucrene Horse Feed.....	13.19	13.50	3.38	3.50	2157
American Milling Co					
Blue Grass Mixed Feed.....	10.19	11.59	2.68	3.19	2207
A. M. Waller & Co.....					
Queen Stock Feed.....	7.81	9.20	2.58	4.10	2099
Brown Milling Co.....					
Horse Feed	12.00	12.00	5.13	4.50	2072
Buffalo Cereal Co	12.13	12.00	—	4.50	2170
Green Diamond Sugar Feed.....	16.31	16.50	4.00	3.50	2083
Chapin & Co	12.69	16.50	—	3.50	2153
Triangle Calf Feed	23.75	22.00	13.03	10.00	2139
Chapin & Co					
Wirthmore Hominy Feed	11.13	10.50	9.80	7.50	2150
Chas. M. Cox Co.....					

*So far as known this did not come into Maine.

†25% protein and fat.

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found— per cent.	Guaranteed— per cent.	Found— per cent.	Guaranteed— per cent.	
Wirthmore Wheat Feed	16.00	17.00	4.65	4.00	2074
Chas. M. Cox, Agents					
Empire Feed	8.25	7.63	4.08	3.97	2069
Empire Mills, Olean, N. Y.	8.38	7.63	-	3.97	2179
Pearl Oat Feed	9.69	10.00	8.23	6.00	2092
Flint Milling Co.	10.25	10.00	8.18	6.00	2185
Vulcan Blended Grains	24.25	24.00	6.21	7.00	2143
Flint Milling Co.					
Ioko Poultry Food	21.88	21.00	6.53	4.50	2118
Flint & Stetson, Damariscotta.					
Boss Corn & Oat Feed	7.94	9.00	4.05	4.00	2205
Great Western Cereal Co.					
Royal Oat Feed.	5.44	7.60	1.57	2.80	2138
Great Western Cereal Co.					
Monarch Chop Feed	7.94	8.09	4.00	4.16	2108
Husted Milling & Elevator Co.					
H-O Horse Feed.	13.63	12.00	5.53	4.50	2087
H-O Co., Buffalo.	13.63	12.00	-	4.50	2206
New England Stock Feed.	10.00	9.00	5.58	4.00	2101
H-O Co., Buffalo.					
H-O Dairy Feed.	18.00	18.00	5.27	4.50	2100
H-O Co., Buffalo.					
Jersey Mixed Feed	13.88	12.05	3.35	3.20	2186
Indiana Milling Co.					
Indiana Mixed Feed	12.25	-	4.30	-	2102
Unguaranteed. An adulterated bran.	13.88	-	-	-	2197
Dairy Mixed Feed	11.13	12.05	3.00	3.20	2098
Jennings & Fulton, Boston.					
Protina Dairy Feed.	17.38	20.00	4.72	3.50	2075
Purina Mills.	17.25	20.00	-	3.50	2171
Victoria Chop	8.63	8.11	3.78	3.05	2199
The Royce & Coon Grain Co.					
Standard Middlings.	17.19	18.00	6.36	4.00	2154
Washburn Crosby Co.					
Hammond Dairy Feed.	11.69	17.00	4.34	3.00	2020
Western Grain Products Co.	15.88	17.00	6.52	3.00	2026
	17.15	17.00	-	3.00	2037
	14.69	17.00	-	3.50	2204
Haskell's Stock Feed	9.25	10.00	7.38	6.25	2090
W. H. Haskell & Co.	9.25	10.00	-	6.25	2152
Kaffir Corn Meal	10.38	-	8.36	-	2114
S. W. Thaxter & Co., Portland.					

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found — per cent.	Guaranteed — per cent.	Found — per cent.	Guaranteed — per cent.	
Corn meal	8.50	-	-	-	2129
B. F. Parrot Co	8.56	-	-	-	2130
Gold Mine Mixed Feed	13.94	-	-	-	2023
American Cereal Co					
William Tell Mixed Feed.....	16.56	-	-	-	2052
Ansted & Burk	15.44	-	-	-	2096
	15.63	-	-	-	2201
	16.00	-	-	-	2203
King Feed	17.56	-	-	-	2202
A. P. Moore Milling Co.....					
Extra Fine Winter Mixed Feed	16.75	-	-	-	2149
Burns Bros					
Winter Wheat Bran.....	14.31	-	-	-	2112
Dorr & King, Pittsfield.....					
Vermont Mixed Feed	14.06	-	-	-	2024
Flint Milling Co	15.44	-	-	-	2027
	15.44	-	-	-	2056
	17.63	-	-	-	2142
	17.00	-	-	-	2191
Sunshine Mixed Feed.....	15.88	-	-	-	2148
Hunter Bros. Milling Co	15.75	-	-	-	2193
Mixed Feed.....	14.88	-	-	-	2008
Huron Milling Co ...					
Bran.....	14.69	-	-	-	2061
Jennings & Fulton, Boston, Shippers					
Flake Bran	13.88	-	-	-	2190
J. Hote & Sons, Lyons, Mich.....					
Mixed Feed.....	14.56	-	-	-	2192
J. Hote & Sons, Lyons, Mich.....					
Snowflake Mixed Feed.....	17.38	-	-	-	2147
Lawrenceburg Roller Mills Co					
Missouri Valley Mixed Feed.....	16.00	-	-	-	2058
Missouri Valley Milling Co	16.63	-	-	-	2145
Planet Spring Wheat Mixed Feed.....	15.06	-	-	-	2021
N. W. Consolidated Milling Co.....					
Pillsbury's Bran.....	15.06	-	-	-	2113
Pillsbury's XX Daisy Feed Flour.....	17.13	-	5.13	-	2135
Pyramid Mixed Feed	15.81	-	-	-	2022
Portland Milling Co.....	14.44	-	-	-	2055
	15.31	-	-	-	2151
Coarse Bran	16.63	-	-	-	2006
Washburn Crosby Co.....	15.00	-	-	-	2144

Analyses of Samples.

Name of Feed and Manufacturer or Shipper.	PROTEIN.		FAT.		Station number.
	Found — per cent.	Guaranteed — per cent.	Found — per cent.	Guaranteed — per cent.	
Louisville Mixed Feed	16.00	-	-	-	2057
Washburn Crosby Co					
Winter Wheat Mixed Feed	15.25	-	-	-	2141
Wm. A. Coombs					
Middlings	16.63	-	-	-	2137
W. Stock and Son					
Phoenix Mixed Feed	14.50	-	-	-	2053
Beef Scrap	58.00	-	23.55	-	2117
Armour & Co					
Bowker's Animal Meal	47.38	30.00	10.35	5.00	2104
Bowker Fertilizer Co.	34.75	30.00	-	5.00	2166
Bowker's Beef Scrap ...	46.63	-	14.03	-	2063
Bowker Fertilizer Co.					
Cornell Beef Scrap	50.75	-	13.65	-	2065
Cornell Manufacturing Co					
Cypher's Beef Scrap	55.50	-	13.75	-	2064
Cypher's Incubator Co					
Purity Beef Scrap	63.25	60.00	12.62	5.00	2215
Geo. B. Haskell Co., Lewiston					
Dow's Beef Scrap	45.63	50.00	26.90	15.00	2105
John C. Dow Co., Boston					
Beef Scrap	40.75	40.00	-	15.00	2001
Portland Rendering Co.	53.50	40.00	18.80	15.00	2081
	51.06	40.00	-	15.00	2163
	47.69	40.00	-	15.00	2160
Bone and Meat Meal for Poultry	42.25	40.00	12.10	8.00	2159
Portland Rendering Co.					

DISCUSSION OF THE RESULTS OF ANALYSES.

However feeding stuffs may differ in their sources, they owe their value to certain constituents that are common to all of them. Feeding stuffs, like other foods, are of value in the animal economy for two distinct purposes. They build new tissues and serve as sources of energy for the performance of work, both within and without the animal body. The protein of the feeding stuff serves as building material. The starches and fats are of value as sources of energy which enable the body to do its work.

The average farmer should have no difficulty in growing all of the energy producing foods that he needs. Where a large number of animals, particularly dairy animals, are kept it is not usually practicable to grow all of the needed protein. While such crops as clover, peas, oats and other materials relatively rich in protein can be grown in sufficient amount to more or less completely supply the needs of the animals kept upon the farm, the protein supply must commonly be supplemented by the purchase of commercial feeding stuffs. Thus it usually happens that when the farmer goes to the market for the purchase of feeding stuffs, it is protein that he needs rather than starches and fats.

From the standpoint of the average feeder, protein is the most important measure of a commercial feeding stuff. While the energy producing carbohydrates and fats are just as important in the animal economy as is the protein, it is usually the case that the feeder does not need to buy the energy foods but needs to purchase protein. This constituent is determined in all samples collected by the inspector or sent to the Station by correspondents. The fats are not as important and in goods of the same class are more apt to run uniform than the protein, and for these reasons, the percentage of fat is usually determined only in one sample of each brand of goods analyzed. While on some accounts it is to be regretted that the funds for the feeding stuff inspection are so limited that only a partial examination of the samples collected is possible, for the most part this partial analysis serves the purpose fairly well. Occasionally in goods that are suspected of adulteration, it would be desirable to make much more extended examinations than is at present possible.

COTTONSEED MEAL.

Analyses pages 83 and 84.

Cottonseed meal is a by-product from the manufacture of cottonseed oil. After the cotton has been taken from the seed in the cotton gin, the remaining down or "linters" and the hard black seed coats or hulls are removed by machinery. The remainder of the seed is cooked and the oil expressed by high pressure. The resulting cottonseed cake is ground into the bright, yellow cottonseed meal of commerce. Such a meal made from good seed would carry from 40 to 50 per cent of protein. With improvements in the process of manufacture, it is now possible to extract the oil without making all the separations formerly needed. Hence it has come about that the cottonseed meal now offered in the market is as a rule of lower protein content than was the case ten years ago.

The shippers of cottonseed meal formerly guaranteed 43 per cent protein and 9 per cent fat. A large part of the cottonseed meal is used for fertilizing purposes and its nitrogen is guaranteed in the form of ammonia. Prime cottonseed meal from the Atlantic coast states, according to the classification of the Cottonseed Crushers' Association must carry not less than $7\frac{1}{2}$ per cent ammonia. Seven and a half per cent ammonia is equivalent to 38.6 per cent protein; hence it follows that cottonseed meal now classed as prime need carry no more than 38.6 per cent protein. As the same association requires that prime cottonseed meal from the Gulf states must carry not less than 8 per cent ammonia, equivalent to 41.2 per cent protein, prime cottonseed meal as now coming into the market is sometimes guaranteed in accordance with the old standard of 43 per cent protein, while that from the Gulf states may be guaranteed 41 per cent protein and that from the South Atlantic states, 38.6 per cent protein.

The hulls and cotton which should be removed from the seed before it is crushed and pressed, have but little feeding value. A little of these materials has always been present in the meal; with the present processes of manufacture, there is probably more of these materials present than formerly. The demand from feeders for cottonseed meal has so increased the value of this by-product, that the temptation to include as much of the hulls and cotton as practicable is great. The processes of man-

ufacture in different mills also vary so that the meal from one mill will contain more of the dark hulls which gives the dark colored meal of inferior feeding value.

Strictly first-class cottonseed meal is always bright and yellow and should have a pleasant nutty flavor. Not all dark colored cottonseed meal is necessarily adulterated. The spontaneous heating of the seed in the field, or over cooking of the "meats" may render the meal dark in color without changing its composition. Such meal is not first quality, however, and should be sold at a lower price.

The hulls are lighter in weight than ground cottonseed cake and their presence in meal, particularly if they are not finely ground, can be readily detected by stirring a little of the meal in a tumbler with hot water. The hulls will settle out more slowly and will appear on the top of the meal in the bottom of the tumbler. Testing high grade meal in comparison with a poor meal will usually familiarize one with this simple yet quite reliable test.

With the exception of samples of cottonseed meal submitted by jobbers for the purpose of learning their quality, no cottonseed meal has been found in the State that was below the Cottonseed Crushers' Association standard for prime cottonseed meal. It will be noted, however, that none of the cottonseed meal has run above 45 per cent in protein and that most of it has carried about 40 per cent protein. The practical feeder can hardly count upon cottonseed meal carrying much more than 39 per cent protein and 8 per cent fat.

COTTONSEED FEED.

Analyses page 84.

Two samples of cottonseed feed, both from the D. L. Marshall Company were sent to the Station. These were approximately correctly guaranteed in their percentage of protein. Unless cottonseed feed can be bought for less than half the price of cottonseed meal, it is probably not an economical feed for Maine.

LINSEED MEAL.

Analyses page 84.

Linseed meal is made by grinding flax seed from which the oil has been more or less completely removed. Most of the oil meal now on the market is new process meal in which the fat is

extracted by the use of naphtha. New process linseed meal is somewhat lower in fat and higher in protein than old process. These goods, so far as sampled, are as guaranteed.

VISCID OIL MEAL.

Analyses page 84.

A sample of viscid oil meal sent by the manufacturers was found to analyze as follows: Water, 7.98 per cent; ash, 6.58 per cent; protein, 30.88 per cent; crude fiber, 11.86 per cent; nitrogen free extract, 37.67; fat, 5.03.

A sample taken in the open market the present year was found to carry 28.81 per cent protein and 11.63 per cent fat. So far as the composition is concerned, the goods seem to be of good feeding value. Of course a feeding test would be necessary to ascertain its true feeding value. Unless it can be bought at a much lower price than good linseed oil meal, it would seem to be wiser to use the linseed oil meal rather than the viscid oil meal.

GLUTEN MEALS AND FEEDS.

Analyses pages 84 and 85.

Gluten meals and feeds are the by-products left in the manufacture of starch and glucose from Indian corn. Corn consists largely of starch. The waste product in the manufacture of starch and sugar is relatively richer in oil and protein than is corn. Most factories remove part of the corn oil from the waste so that nearly all the gluten meals carry less oil than they did a few years ago.

Gluten feeds differ from gluten meals in that they contain considerably more of the corn bran and hence relatively less protein, fat and digestible carbohydrates, and more of the indigestible woody fiber. Gluten products which were formerly quite extensively used in Maine, continue to be rather unsatisfactory forms of concentrated feeds, chiefly because of their uneven composition.

Chicago gluten meal made by the Glucose Sugar Refining Company carries about 5 per cent less protein than its guarantee. The analyses of the Maine samples agree in the low protein content with those found in New York, Connecticut, Massachusetts and Vermont.

Jenks gluten meal is somewhat lower in protein than Chicago gluten meal, but contains more fat. It is incorrectly guaranteed so far as protein is concerned. The gluten feed made by Douglass & Company has 4 per cent less protein than guaranteed. Buffalo gluten feed is carrying approximately its guaranteed percentage of protein. The sample of Jenks gluten feed, guaranteed 27 per cent protein, very materially overrun the protein content; while Bay State gluten feed carried 5 per cent less protein than the guaranteed called for. Tiger gluten feed has no substantial agreement with its guarantee. Warner's gluten feed is about 2 per cent below guarantee.

It is unfortunate that the gluten feeds and meals are so irregular in their composition and that different makes vary so greatly. The gluten meals and feeds are desirable sources of protein and if the manufacturers placed proper guarantees upon their goods, there seems to be but little reason why this class of feeding stuffs should not become as popular as they were a few years ago.

DISTILLERS GRAINS.

Analyses page 85.

In composition, dried distillers grains resemble the gluten feeds. They are derived chiefly from corn from which the starch is removed by fermentation. They are more bulky than the gluten feeds and for the most part run higher in protein. A feeding test with distillers grains was reported in Bulletin 92 of this Station.

Two samples of Anchors distillers grains, guaranteed to carry 25 per cent protein and fat, were examined. These were very unusually low grade distillers grains. Biles Foureux continues to run in fair accordance with its guarantee.

Union grains are a ready made mixture carrying the protein and fat practically in accord with the guarantee. They are made up of distillers grains, gluten feed, ground corn, ground oats, and oil meal. For the farmer who must buy all his feed, Union grains at a fair price would probably prove profitable. As a rule, however, oats and corn are profitable for cows when the feeds are home grown and are expensive feeds to purchase. A

feeding test with Union grains was reported in Bulletin 106 of this Station.

MOLASSES FEEDS.

Analyses page 85.

Feeding experiments with molasses feeds have shown them to be fairly economical. They, however, are not used very much in this State and should not be purchased by the ordinary farmer since they are low in protein and high in carbohydrates. Feeders who find it necessary to purchase nearly all of their food may find these molasses feeds economical.

The one sample of the Molasses dairy feed of the American Cereal Company was lower in protein than the guarantee. The Molasses horse feed of the American Cereal Company and the Sucrene horse feed of the American Milling Company have practically agreed with guarantee in protein and fat. The Molasses dairy feed of the American Cereal Company ran nearly 2 per cent below its guaranteed percentage of protein. It is to be remembered, however, that this class of feeds are sold not as a source of protein but for the soluble carbohydrates which they contain, and the lower protein means more of the carbohydrates. Sucrene dairy feed has usually run well up to its guarantee. A lot sampled at Portland was found to be unusually low in protein and a second sample was drawn which carried nearly 3 per cent more of protein than the first, but both of them were low. The matter was taken up with the manufacturers and they were unable to explain the low protein content.

One sample of the Green Diamond sugar feed also ran considerably below its guaranteed percentage of protein. The makers explained this from the fact that an excess of molasses was used in its manufacture. In their letter they state that while this is not sold as a protein feed, they still desire to have the labels on the bags agree with the protein content of the goods, and will endeavor to keep the protein content fully up to the guarantee.

REFUSES FROM MILLING OATS, CORN, ETC.

Analyses pages 85 to 87.

The market still carries a large number of oat feeds, corn chops, corn and oat feeds and similar offals by themselves and

blended with concentrated feeds. They vary in composition from the straight oat hull refuse with perhaps 6 per cent protein, to the blends that carry from 15 to 18 or even higher percentages of protein. For the most part these goods are fairly well up to their guarantee and no fault can be found with the manufacturer for desiring to sell these waste products. Few or no claims are made for nutrients which the goods do not actually carry. The feeder has himself to blame if, with barns filled with hay, corn and silage, he buys feeds low in protein instead of those high in protein. An oat feed with 6 per cent protein is no better feed nor is it any better digested than oat straw with the same protein content. This class of feeds can probably be economically used only by feeders who find it necessary to buy "roughage" as well as concentrates.

The manufacturers have notified us that they have changed the minimum guarantee of protein of the Victor corn and oat feed from 9 per cent to $7\frac{1}{2}$ per cent; the Quaker feed from 14 to 12 per cent; Schumacher's stock feed to 11 per cent; American poultry feed to 12 per cent protein; and Vim oat feed to 5.50 per cent protein. The guarantee of the Boss corn and oat feed has been changed to $8\frac{1}{2}$ per cent protein and $3\frac{1}{2}$ per cent fat; and on Friends oat feed the protein has been dropped from 8 to 7 per cent and the fat from 3 to 2.75 per cent; and the Royal oat feed is now guaranteed 6 per cent protein and $2\frac{1}{2}$ per cent fat.

TRIANGLE CALF FEED.

Analyses page 85.

Chapin & Company's Triangle calf feed is claimed to be made entirely of different prepared grains without drugs or condiments, and is intended to be used the same for calves where milk is not available. The sample examined was up to guarantee.

PROTENA DAIRY FEED.

Analyses page 86.

Protena dairy feed continues to run considerably below its guarantee in protein content. Samples examined in Connecticut were found to carry 19 per cent protein. Of two samples examined in New Jersey, one carried 18 and the other 22 per cent protein.

WHEAT BRANS AND MIDDINGS,—MIXED FEEDS.

Analyses pages 87 and 88.

The refuses from the milling of wheat vary, as is to be expected, quite largely in composition. A good quality of mixed feed or wheat bran should carry at least 15 per cent of protein and, as noted in the table, some of them run as high as 17 per cent. With the exception of the mixed feeds from Kentucky, sold under varying names, there seems to be no adulterated wheat bran or middlings upon the market. The Jersey mixed feed of the Indiana Milling Company, and the Indiana mixed feed and Dairy mixed feed of Jennings & Fulton are wheat bran, mixed with other refuses, chiefly corn cobs. Most of these goods offered in the State are properly tagged, carrying not only the percentage of protein and fat, but the statement of their composition, showing the foreign materials that have been added to the wheat bran. In two instances there was an attempt to evade the law by substituting for cob meal in one instance "corn and cob meal" and in another the phrase "crushed ear corn." When, however, the attention of the companies was called to this, proper labels were attached, so that most of the Indiana and similar mixed feeds are now labeled winter wheat bran, winter wheat ship stiff and corn cob meal. Unfortunately, however, there have been some instances in which the jobber, apparently, sold these adulterated goods for straight feeds. In the only instance, however, in which this fact can be definitely proven, there happened to be in the sample submitted an unusually small amount of corn cob so that the adulterated mixed feed carried only a little more crude fiber and but little less protein than a very poor straight wheat offal sometimes carries. On this account the case was not reported for prosecution.

There is no class of feeding stuffs in which the consumer needs to use greater care at present than in the purchase of mixed feeds. While the regular brands are all right, as they have been in the past, there are some spurious articles in the market. It is gratifying to report, however, that on his last tour, the inspector found no considerable amount of this class of goods in the hands of the dealers.

There is so much profit in selling ground corn cobs and broom corn at the price of wheat bran that the consumer must ever be

on the watch against this fraud. The safest thing is to buy only well known, reliable brands of this class of goods. The bulletin gives the names and analyses of many manufacturers of high class brans, and other wheat offals. If consumers will see to it that all of this class of feeds which they buy carries the name of the miller there will be little likelihood of their being defrauded. In case of any doubt, mail a sample to the Station and an analyses will be made and the results reported promptly and without any charge.

MEAT MEALS AND GROUND SCRAPS.

Analyses page 88.

The meat meals and ground beef scraps are used chiefly for feeding poultry and while they are very generally distributed, it is probable that the sales are not as large as some of the other materials coming under the feeding stuffs law. The guarantees placed upon the goods are only a very general guide to the actual composition. It will be noted that in several instances there are no guarantees accompanying the analyses of the samples, but this does not necessarily indicate the goods were not properly branded, as in some instances the samples were submitted by correspondents without the needed data.

In the table which follows, there is given the percentages of ash which were found in the beef scrap and similar materials here reported. The ash measures fairly well the percentage of bone contained in the goods. As the nitrogen in bone is not as valuable as that in meat, this fact should be taken into account in the purchase of beef scrap. Furthermore, the market price of meat meal is considerably higher than that of bone meal. Such a beef scrap as Armour's (No. 2117) which carries no more ash than ordinary meat, would be a much more economical feed than several others of the scraps and meals found in the table in which more than a third of their weight is ash. A meat meal carrying no more than 5 per cent of ash would have a much higher market and much higher feeding value than a meat meal with high ash content.

Ash in Beef Scraps, Meals, Etc.

Station number.	Brand.	Manufacturer.	Per cent ash.
2063	Bowker's Beef Scrap.....	Bowker Fertilizer Company	19.22
2064	Cypher's Beef Scrap	Cypher's Incubator Company.....	19.75
2065	Cornell Beef Scrap.....	Cornell Manufacturing Company..	24.46
2081	Beef Scrap	Portland Rendering Company.....	22.68
2104	Bowker's Animal Meal.....	Bowker Fertilizer Company.....	35.46
2166	Bowker's Animal Meal.....	Bowker Fertilizer Company.....	42.98
2105	Dow's Beef Scrap	J. C. Dow Company, Boston.....	15.65
2117	Armour Beef Scrap	Armour & Company	3.91
2159	Bone and Meat Meal for Poultry	Portland Rendering Company.....	36.18
2215	Purity Beef Scrap.....	Geo. B. Haskell Company	11.08

CONDIMENTAL FOODS.

Although named in the law, the attorney general ruled that, since condimental foods are sold as medicines and not as food they do not come under the law.

Fortunately in the condimental foods offered, injurious drugs are not found. In addition to common feeding stuffs they consist for the most part of old-time simple remedies of mildly curative powers. The claims made for these materials are as ridiculously extravagant as those made for patent medicines designed for the use of man. The absurd testimonials used in their support are doubtless genuine, but are made by people who can not or do not understand the relations of cause and effect.

Facts to be Remembered.

The mixture of ingredients contained in the ordinary foods comprises all that are known either to practice or science as useful to animal life.

The ordinary cattle foods supply animal nutrition in the most useful and economical forms.

Condimental foods are absurd as medicines. If an animal is well no medicine is needed, if ill, remedies adapted to the case should be administered.

The farmer can manufacture his own "condimental" food at a fraction of their usual cost, by mixing a small amount of such common substances as salt, sulphur, saltpeter, fenugreek, cara-

way, etc., with the daily grain ration. This constant use of these "simples" is not recommended.

THE KIND OF CONCENTRATED FEEDING STUFFS TO PURCHASE.

The crops grown upon the farm are rich in carbohydrates and poor in protein. Clover will help supply the needed protein, and home grown grains will help out toward a balanced ration. But after growing all the food that can be produced economically on the farm, the dairyman will usually find that he needs to supplement the home grown food by the purchase of concentrated commercial feeding stuffs.

As the farm produces or can be made to produce all the starch, sugar and fiber that are needed, it is not necessary to take these constituents into account in the purchase of supplementary food materials. While they have a part, and a necessary part, in the ration, it is protein that is needed to supplement the home grown foods, hence the cost per pound of the protein in a given feeding stuff is of more importance than the ton price. A ton of cottonseed meal costs more than a ton of oat feed, but the protein in the former costs less than four cents a pound and ten or more in the other. The following table shows the number of pounds of protein that a ton of a few average feeding stuffs carries, and the cost of a pound of protein at the usual range in selling price.

Cost of one pound protein in different feeding stuffs at different prices per ton.

Kind of feeding stuff.	Protein in ton.	At \$18 per ton.	At \$20 per ton.	At \$24 per ton.	At \$26 per ton.	At \$28 per ton.	At \$30 per ton.
	Pounds.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Cottonseed meal.....	840	....	....	....	3.0	3.3	3.6
New process linseed meal..	750	....	....	....	3.4	3.7	4.0
Old process linseed meal ..	640	....	....	....	4.1	4.4	4.7
Gluten meal	680	....	....	....	3.8	4.1	4.4
Gluten feed	520	....	....	4.6	5.0	5.4	....
Distillers grains	660	....	....	....	3.9	4.2	4.5
Union grains	480	....	....	....	5.4	5.8	6.2
Wheat middlings	360	5.0	5.4	....	....	....	....
Wheat bran	300	6.0	5.7	....	....	....	....
Oat feed as Vim or Royal ..	150	12.0*	....	....	....	....	....

* At \$12 per ton, a pound of protein will cost 8 cents.

WEIGHT OF DIFFERENT CONCENTRATED FEEDS.

It is the common practice in Maine to feed by measure rather than by weight, and since different feeding stuffs vary greatly in weight, it is obviously unfair to compare the feeding values of different feeding stuffs measure for measure. For instance, a quart of cottonseed meal weighs one and one-half pounds, and a quart of dried distillers' grains weighs less than half as much. To assist feeders who have no conveniences for weighing, the following table, prepared by Mr. H. G. Manchester, West Winsted, Conn., is reprinted from Bulletin 145 of the Connecticut Agricultural Experiment Station.

The average weight of one quart of each of the feeds named.

	Pounds.
Cottonseed Meal.....	1.5
Linseed Meal, old process.....	1.1
Linseed Meal, new process.....	0.9
Gluten Meal.....	1.7
Gluten Feed.....	1.2
Distillers' Grains.....	0.7
Wheat Bran, coarse.....	0.5
Wheat Middlings, coarse.....	0.8
Wheat Middlings, fine.....	1.1
Mixed Wheat Feed.....	0.6
Corn Meal.....	1.5
Hominy Meal.....	1.3
Oats	1.2
H. O. Dairy Feed.....	0.7
Victor Corn and Oat Feed.....	0.7

FREE ANALYSIS OF FEEDING STUFFS.

The Station officers take pains to obtain for analysis samples of all feeding stuffs coming under the law, but the co-operation of consumers is essential for the full and timely protection of their interests. Whenever anyone believes that this law is being evaded in any way, he is requested to notify the Director of the Station.

The Station will promptly analyze samples of feeding stuffs sold in Maine taken in accordance with the following directions, and report the results without any charge to the interested parties. Dealers and consumers are urged to avail themselves of this offer.

DIRECTIONS FOR SAMPLING.

The sample should fairly represent the feeding stuff and is best obtained as follows:

Open one or more full and unbroken packages, and mix well together the contents of each for a foot in depth, take out three cupfuls from different parts of the mixed portions of each package, pour them one over another upon a paper, intermix thoroughly, and fill a tin spice or baking powder box from the mixture. Upon paper plainly write (1) the name of the goods; (2) the name of the manufacturer; (3) the guaranteed percentages of protein and fat; (4) the name and address of the dealer; and (5) the name and address of the sender. Securely wrap the box and description of sample in paper and send by mail to the

Agricultural Experiment Station,

Orono, Maine.

FREE ANALYSIS OF FEEDS, FOODS, FERTILIZERS, AND SEEDS.

The Station takes pains to obtain for analysis samples of all brands of fertilizers and feeding stuffs coming under the law. It also draws samples of agricultural seeds and foods in the hands of dealers. The co-operation of dealers and consumers is, however, essential for the full and timely protection of their interests.

Foods. Dealers and consumers are invited to send by pre-paid express original and unbroken packages of food materials on sale in Maine of whose purity they are for any reasons suspicious. As prompt free analysis will be made of such samples as circumstances will allow.

Feeding Stuffs. The Station will promptly analyze samples of feeding stuffs sold in Maine taken in accordance with directions which will be furnished on application. The results will be reported without charge to interested parties. This applies to dealers and consumers alike.

Commercial Fertilizers. It is difficult to draw accurate samples of commercial fertilizers. On this account it is only in rare instances that the Station undertakes analyses of fertilizers other than the samples collected by its representatives. In case there is special reason for an examination, the Station invites correspondence on the subject.

Agricultural Seeds. Samples of agricultural seeds on sale in Maine, taken in accordance with directions which can be obtained on application to the Station, will be examined as promptly as possible and the results reported free of charge.

In all cases samples should be accompanied by a full description of the goods, including the name and address of the dealer and the sender. Small samples other than liquids can be forwarded by mail. Others should be forwarded by express, charges prepaid. Both mail and express matter should be addressed to the

AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.

